WORKING PAPER

Summary of British Columbia Forest Inventory Statistics by Land Administration Class

Volume 2. Kamloops Forest Region

10/1995

Province of British Columbia
Ministry of Forests Research Program

This Research Program Working Paper is an internal report of interim research results with field applications. It is intended to generate discussion and general feedback.

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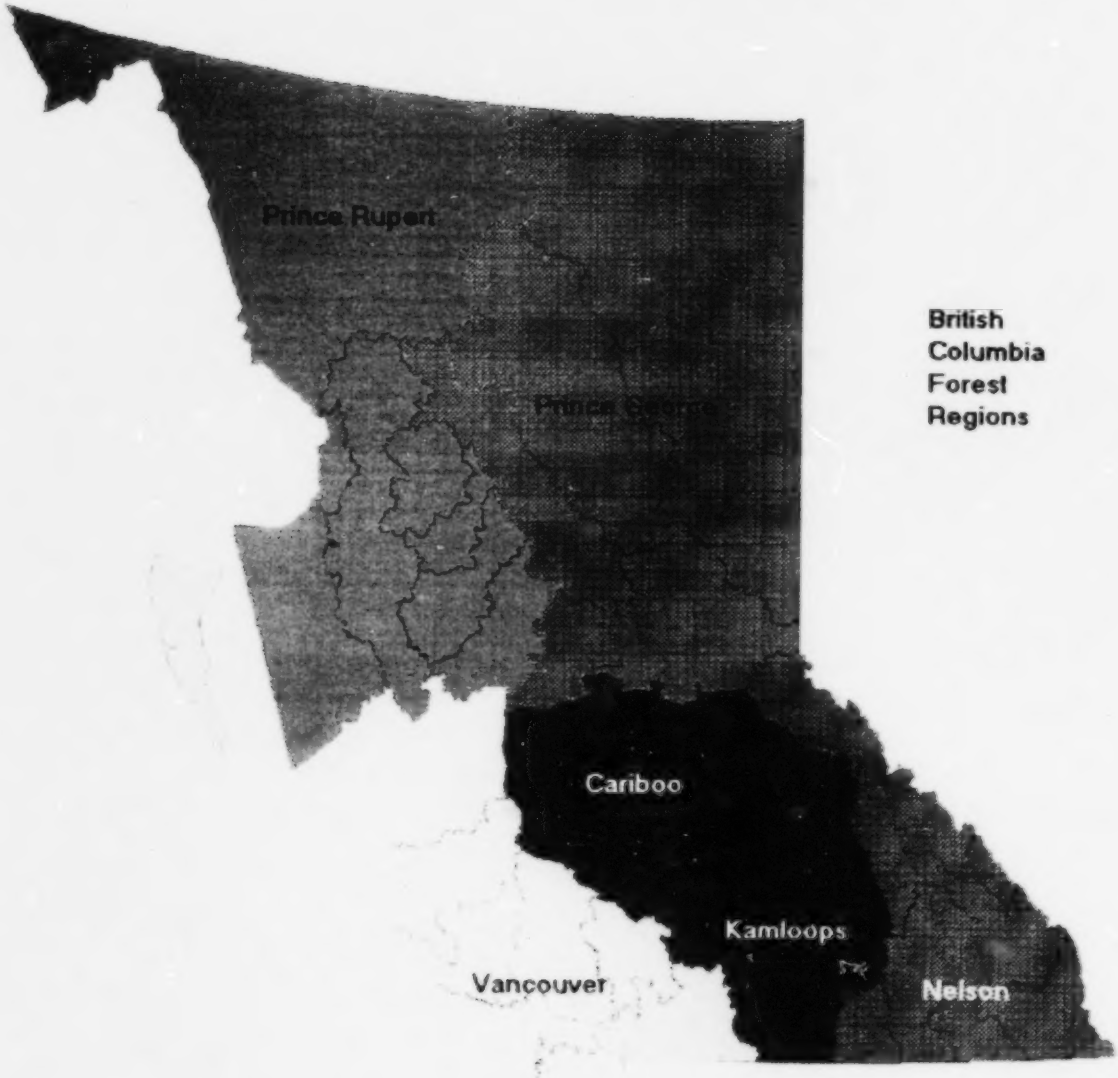
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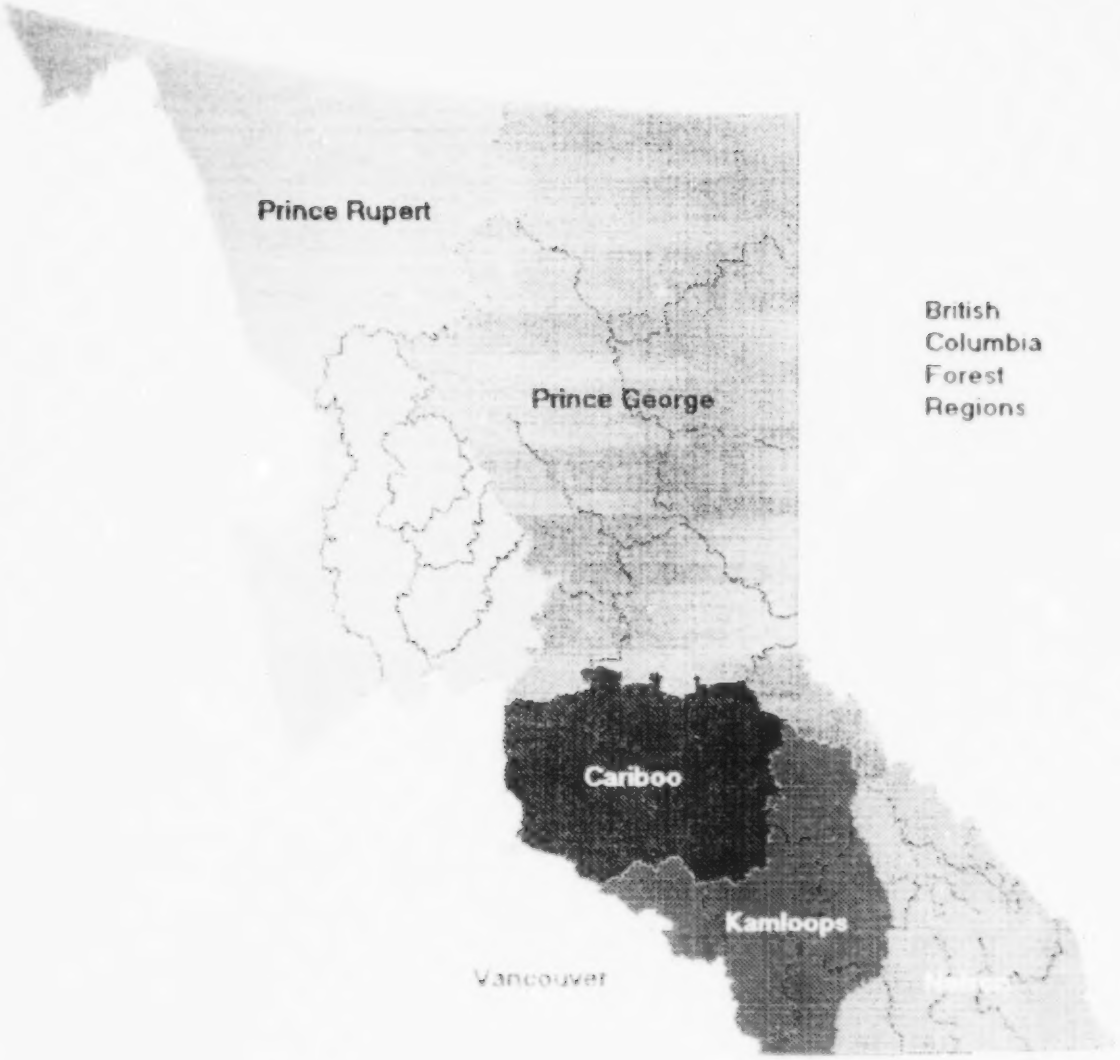

British Columbia Forest Regions

INTRODUCTION

This report provides current, comprehensive, and easy-to-read forest resource statistics for anyone interested in the forest resources in the Province of British Columbia.

The Ministry of Forests' Resources Inventory Branch compiles and maintains forest inventory information (statistics and maps) for all land in the province. This includes federal lands within Timber Supply Areas (TSAs). On Tree Farm Licences (TFLs) the licensee is required to perform the inventory and provide the data according to a standard set by the Forest Service.

Forest cover data are obtained at district and regional levels and are linked with geographic data (base maps, ownership and administrative boundaries) to produce an inventory/database that provides information on the location, areal extent, physical characteristics, and condition of the forest.

The Forest Inventory Program currently maintains approximately 7,000 map sheets at 1:20,000 scale that describe forest, range, and recreation resources. Map sheets are updated for changes every 2 years (Forest Inventory Manual 1992). With the exception of managed forest units, timber inventories are not available for most private land (Determining the Accuracy of Forest Inventories 1993).

Organization of the Report

For administrative purposes, British Columbia is divided into six Forest Regions: Cariboo, Kamloops, Nelson, Prince George, Prince Rupert, and Vancouver. Each region is, in turn, divided into districts.

The information in this report has been organized into six volumes, one volume per Forest Region.

Four reports have been generated for each Timber Supply Area (TSA), Tree Farm Licence area (TFL), and protected area of more than 100 hectares within each Forest Region. Each volume has been subdivided into sections by TSA for areas within TSA boundaries and by TFL or protected area for areas outside TSA boundaries.

Report 1 presents area and volume data for each inventory type group by age class and height class.

Report 2 summarizes area and volume data for all ages by inventory type group by height class.

Report 3 presents area and volume data for all inventory type groups older than 120 years by height class.

Report 4 presents "old-growth" area and volume data by height class for:

- stands with lodgepole pine, whitebark pine, and deciduous species leading older than 120 years (age classes 7, 8, and 9).
- stands of all other coniferous species older than 140 years (age classes 8 and 9).

CONTRIBUTORS

Andy MacKinnon, Research Branch: project leader.

John Brodie, Resources Inventory Branch: assembly and conversion of inventory data, and supervision and assistance with creation.

Marta Buckiewicz and Terry Hamelin, Camosun College co-op students: organization and tabulation of the data. (Marta Buckiewicz also wrote the introduction and assisted in assembling the final report.)

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HISTORY OF FOREST INVENTORY IN BRITISH COLUMBIA

Inventory of the forest resource has been an ongoing process since the Forest Service was established in 1912.

Early inventories were based on military reconnaissance surveys. Estimates of volume were made by drainage basin and Forest District (roughly coincident with present Forest Regions).

Procedures and standards have changed substantially since that time.

The first complete inventory of the province, which took place from 1951 to 1957, was intended to provide average statistics for groupings of similar forest types. Sampling was performed in accessible areas and broad forest classification was done through interpretation of aerial photographs (Forest Inventory Manual 1992).

Most of the volume data in the inventory database were collected during the survey done from 1961 to 1977. Aerial photos, supported by stand estimates from helicopter and ground measurements, were used in estimating forest attributes. The major sampling units were management areas referred to as Public Sustained Yield Units (PSYUs). More detailed forest classification was possible due to improvements in the quality and scale of aerial photos. The program was also expanded to identify environmentally sensitive areas (ESAs).

In 1978, inventory standards and procedures were revised to reflect the need to provide more descriptive statistics for smaller geographic areas. The existing database was re-organized to accommodate the switch from Imperial measure to metric and the replacement of Public Sustained Yield Units with Timber Supply Areas (Forest Inventory Manual 1992).

Computerized mapping systems were introduced at this time and the process of converting the map sheets to a digital format was initiated.

Forest inventories continue to depend primarily on aerial photography supported by ground sampling. Growth and yield models are used to estimate timber volumes, and satellite imagery is used to update depletions resulting from harvesting, fire, and damage by insects and disease.

All files in the database used to generate this report have been updated since 1990. Files referred to as "other data" were projected to 1984 for parks and to approximately 1989 for TFLs.

LIMITATIONS OF EXISTING INVENTORIES

Park boundaries for recently created parks have not been digitized in the database. Through a 2-year update cycle, all new boundaries are digitized. Although detailed forest cover information may be reported for the park, it will be included in another administrative unit such as a TSA. Forest cover for some larger, older parks may exist in paper format, but may not be available in digital format.

Since the original survey, most park inventories have not been updated to reflect changes due to natural disturbances such as wildfire, insect damage, or disease.

Differences exist in inventory standards for inventories taken outside the direction of the Forest Inventory Program. Forest classification, and detail and scale of mapping, will vary for units not under forest management. For example, inventory information for federal parks is limited to generalized biophysical mapping, and information for specific forest groups is not available. Inventory data for private lands are largely unavailable.

LAND ADMINISTRATION IN BRITISH COLUMBIA

British Columbia is the third-largest province in Canada, covering an area of approximately 94.8 million hectares (British Columbia Land Statistics 1988).

Most of this land (93%) is publicly owned provincial Crown land. Federal lands consisting of National Parks, Aboriginal Reserves, and Department of Defence and Ministry of Transport lands cover 1% of the land base. The remaining 6% is privately owned (British Columbia Land Statistics 1989).

About 85% (80.7 million hectares) of British Columbia's total area is Crown land managed by the Ministry of Forests and designated as "provincial forest."

Of the areas designated provincial forest, 43.3 million hectares is productive forest land managed for timber production, recreation, and wildlife. The rest of the provincial forest is alpine, range, and water.

Only half of the productive forest is considered available and suitable for growing commercially harvestable timber. Forest land not presently productive includes areas that are inaccessible, environmentally sensitive, not satisfactorily restocked, or covered by noncommercial tree species.

Forest Tenures

In British Columbia, the right to harvest timber is usually allocated to individuals and forest companies by the provincial government in the form of timber tenures. To facilitate administration of these tenures, the province has been divided into management units referred to as *Timber Supply Areas* (TSAs) and *Tree Farm Licence* areas (TFLs).

In *Timber Supply Areas*, forest companies manage the timber resource according to resource management plans prepared by the Forest Service. The companies are granted the right to harvest a specified volume of timber annually through the issuance of several different types of timber tenures. Each type of tenure has its own specific forest management obligations.

A *Christmas Tree Permit* allows the use of Crown land for Christmas tree production.

The *Tree Farm Licence* (TFL) is an area-based tenure in which forest companies have been delegated "stewardship" responsibilities over an area with fixed boundaries. This includes the right to harvest a specified volume of timber annually and the obligation to carry out most of the forest management activities, which are monitored by the Forest Service. Licensees are required to submit a Management and Working Plan prepared by a Registered Professional Forester for approval by the Chief Forester. The Management and Working Plan must contain an inventory of the forest and recreation resources, a proposed annual cut, and proposals for the management and protection of those resources (Forestry Handbook for British Columbia 1983).

A *Woodlot Licence* is similar to a Tree Farm Licence, but the scale of operations is smaller. Any size of private land may be included in the licence, but the Crown land portion must not exceed 400 hectares. Woodlot licences have a term of 15 years and are replaceable every 5 years. As with TFLs, the licensee must submit a Management and Working Plan (Forest Management in British Columbia 1992).

Managed Forest Units are areas of private land that have been classed as "forest land" by the British Columbia Assessment Authority. If managed in accordance with an approved Management Working Plan, which includes an allowable cut and reforestation responsibilities, these lands become eligible for a lower tax assessment. Although forest inventories of these areas are included in the Management Working Plan, they are confidential.

Protected Areas

More than 8 million hectares of land have protected area status in British Columbia. Various levels of government and non-government organizations are involved in the management of these areas.

Management policies and the level of legislative protection received varies for each type of protected area. Some areas are strictly protected with no resource extraction or development permitted. Others allow various degrees of resource extraction such as mineral exploration and development (Protected Areas Strategy 1992).

Federal Programs There are six national parks covering more than 600,000 hectares in British Columbia; two, South Moresby National Park Reserve and Pacific Rim National Park Reserve, have a marine component. Although some biophysical mapping has been completed for several national parks, inventory information is very general and does not provide specific information with respect to the age and height of individual forest types. Detailed

inventories for national parks in the Nelson Region, for instance, are not available.

Two federal wildlife management programs, administered by the Canadian Wildlife Service, operate in the province: migratory bird sanctuaries and national wildlife areas. These areas are designated on both public and private lands and are generally small, covering a total of approximately 5,400 hectares. Most of these sites are located in wetland areas without significant forest cover.

Provincial Programs Most of the protected areas in British Columbia are administered by the Ministry of Environment, Lands and Parks. These areas, which encompass 6.6 million hectares, include provincial parks, recreation areas, wilderness areas, wilderness conservancies, and ecological reserves. Each of these areas is managed by a unique set of administrative conditions.

Class A Provincial Parks prohibit all commercial resource extraction. Special zoning within individual parks can limit access, facility development, and outdoor recreation.

Nature Conservancies within Class A parks are roadless areas reserved for the preservation of representative ecosystems and landforms in their natural state.

Class B Provincial Parks permit commercial resource extraction (i.e., mining).

Class C Provincial Parks are small community parks, often near urban areas, which are gradually being turned over to municipal and regional parks for administration.

Recreation Areas are lands held in park reserve for a minimum period of 10 years to permit mineral and energy resource evaluation. Following this assessment they may be recommended for upgrade to full protection status as Class A parks.

Wilderness Areas are areas of land, usually greater than 1,000 hectares, that retain their natural character and are relatively unaffected by human influences. These areas are designated and managed by the Ministry of Forests. Although commercial logging is prohibited, mining and other commercial activities may be allowed, provided they are compatible with the preservation of wilderness. Hunting, fishing, and trapping may also be permitted (Managing Wilderness in Provincial Forests 1992).

Wilderness Conservancies are roadless areas in which the natural and ecological communities are preserved. Commercial resource extraction such as mining and logging is prohibited, but hunting is permitted.

Ecological Reserves are protected natural areas intended primarily for scientific purposes and educational programs. These areas have been set aside to preserve rare, unique, and endangered native plants and animals in their natural habitats. Ecological reserves receive the highest level of protection and are the areas least subject to human intervention. All commercial and consumptive resource activities are prohibited. Public access is regulated

and recreation is limited to observational activities. Almost half the area protected as ecological reserves is marine or subtidal.

Wildlife Management Areas are lands administered by the Ministry of Environment for the protection of fish and wildlife. These sites are generally small and consist mainly of wetland or grassland habitats. Commercial resource extraction and development may be permitted.

FOREST CLASSIFICATION

Forest land is classified by biophysical characteristics that can be recognized and differentiated on aerial photographs. Land is divided into homogeneous strata based on a set of well-defined criteria, which can be recognized on aerial photographs with a minimum of ground control. Forest and non-forest types (polygons) are digitized and their respective descriptions are entered onto attribute files.

For inventory purposes, 28 commercial and 11 non-commercial tree species are recognized in British Columbia. A single, uppercase letter describes each genus and an upper- and lowercase letter describes the genus and species respectively.

The 28 commercial tree species are grouped into 42 associations or Inventory Type Groups (ITGs). These groups are assigned a numeric code and named according to the dominant or leading species represented in that area. A stand will occasionally contain two almost equal species. The resulting type group name then combines both the leading and secondary species (Forest and Range Resource Analysis 1984).

Inventory Type Groups with common leading species can be combined into growth types.

Growth types are defined as follows:

TYPE GROUPS	GROWTH TYPES
1 – 8	Douglas-fir
9 – 11	Western redcedar or yellow-cedar
12 – 17	Hemlock
18 – 20	True Firs
21 – 26	Spruce
27	Western white pine
28 – 31	Lodgepole pine
32	Ponderosa pine
33 – 34	Larch
35 – 42	Deciduous

Individual trees are aged based on ring counts. The age of a stand of trees is calculated as the average age, in years, of the dominant and co-dominant trees for the leading species. Even-aged stands will have small age differences (less than 20 years) between individual trees whereas uneven-aged stands will exhibit a variable age pattern. Stands are assigned an age class code from 1 to 9. From 1 to 7 the class intervals are 20 years. Age class 8 contains stands from 141 years to 250 years and age class 9 includes all trees older than 250 years.

AGE CLASS	AGE RANGE (Years)
1	1 – 20
2	21 – 40
3	41 – 60
4	61 – 80
5	81 – 100
6	101 – 120
7	121 – 140
8	141 – 250
9	251 +

Height or "top height" of a stand of trees is measured as the average height, in metres, of the dominant and co-dominant trees for the leading species. Stand height is an important measure of productivity and is strongly correlated with volume. The height range of a stand of trees is grouped into approximately 10-metre intervals, referred to as height classes.

HEIGHT CLASS	HEIGHT RANGE (Metres)
1	0 – 10.4
2	10.5 – 19.4
3	19.5 – 28.4
4	28.5 – 37.4
5	37.5 – 46.4
6	46.5 – 55.4
7	55.5 – 64.4
8	64.5 +

Although a single, generally accepted definition of old-growth forest does not exist, working definitions to identify old-growth forests are needed. Age and height are important structural criteria used in identifying mature and old-growth forests using the existing forest cover database (An Old Growth Strategy for British Columbia 1992).

Stands with lodgepole pine, whitebark pine, or a deciduous species leading are considered mature at 81 years. Otherwise, all stands with conifers other than lodgepole pine and whitebark pine as the leading species are mature when the stand age is greater than 120 years.

For this report, stands with most conifer species leading, greater than 140 years in age were considered old growth. Stands with lodgepole pine or deciduous species leading were considered old growth at more than 120 years of age.

Area is the land surface measured in hectares. One hectare (10,000 square metres) is equivalent to 2.4 acres.

Volume is the amount of wood in a tree, stand, or other specified area. The unit of measurement is cubic metres. As an example, there are about two and a half cubic metres in a telephone pole.

Volumes in this report are estimates only. More current volume calculations are used in inventory and planning for forest management purposes.

Volume may be a gross total, which is the volume of the main stem, including the stump and top as well as defective and decayed wood. Gross merchantable volume refers to the volume of the main stem, excluding the stump and top but including defective and decayed wood. Net merchantable volume is used in this report and includes the main stem and excludes a 30-cm stump, the top above a 10-cm diameter, and only includes trees with a diameter greater than 17.5 cm at 1.3 m above germination. An allowance is also made for decay, waste, and breakage. Volumes in this report were calculated using the projected age of the stand, its site index, and stocking class with coefficients based on the stand's geographic area and its inventory type group. Other coefficients based on location are used to determine utilization.

Volume per hectare refers to the volume of wood, less decay, waste, and breakage, per hectare, calculated for the specific area. In the following reports, volume per hectare was calculated to more significant figures than were the area and volume figures. On small areas, division may not result in identical numbers. Minor discrepancies in totals may also occur due to rounding error.

FUTURE OF FOREST INVENTORY IN BRITISH COLUMBIA

The Forest Resources Inventory is a dynamic inventory that will continue to develop and improve over time. The following is the Forest Inventory Program's vision for the future.

The Forest Resources Inventory, a geo-referenced repository of current and historic, comprehensive, accurate, and consistent forest resources data, will provide support for the complex integrated resource management decisions facing the people of British Columbia.

The forest inventory will provide an ecologically based resource inventory to a minimum standard and allow for enhanced inventories of higher standards where required. The inventory will be stand based and flexible, to meet changing client needs. It will allow for change reporting, monitoring, and independent accuracy assessments to ensure effective planning and management of the province's forests. This program will support and be consistent with the vision of the Forest Productivity Council of British Columbia:

"to be able to consistently and accurately predict the growth, yield and quality of British Columbia's forests under any resource management regime."

The Forest Resources Inventory will comply with the standards of the government-wide Land Information Infrastructure (LandData BC), which facilitates the sharing of land-related information with our clients.

Each Forest District will continuously house and manage its own seamless, integrated forest resources database, including field data capture, update, and quality control. Spatial and attribute data will be captured and managed in an integrated manner to ensure data integrity and to support the seamless view of forest resources data.

As new technologies are introduced to meet changing demands, the Forest Resources Inventory Branch will provide assistance for training, planning, monitoring, and applications development. This will be encouraged through effective communication among staff at all program levels (A Five Year Strategic Plan Commencing 1993/94).

METHODOLOGY

Introduction

The first phase of the provincial inventory program consisted mainly of management unit surveys, designed to provide average statistics for aggregated forest types. By 1978, the entire province was covered with this Level 2 inventory and, subsequently, emphasis was placed on obtaining more detailed information on portions of management units, called sub-units. A major requirement from this detailed inventory was that descriptive data (such as tree volumes) be reliable not only for aggregated types, but in terms of individual forest stands.

During the past 10 years, in addition to sub-unit inventories, the main emphasis has been placed on upgrading the Level 2 information on forest populations that were previously sampled inadequately, on digitizing forest cover maps, and on monitoring depletions with the use of satellite imagery.

In 1988, funds were allocated for the implementation of a provincial re-inventory program and for the completion of the digital conversion of the remaining forest cover maps.

This paper contains an overview of the re-inventory program, including brief descriptions of the operational Geographic Information System (GIS) and satellite image analysis update procedures.

Management Unit Inventories

The classification system used prior to 1978 stratified land into homogeneous strata on 1:15,840 aerial photographs. Areas within management units were first divided into two broad classes: non-forest and forest land. The non-forest land was further subdivided into areas with and without cover. Areas with cover included such types as lowland, alpine, swamp, and other non-productive forest and brush. Areas without cover included productive open range, cultivated and urban areas, and wild meadows, as well as non-productive barren lands and water. Forest land, on the other hand, was strati-

fied as mature, immature, not satisfactorily restocked, mature residual, and non-commercial forest land. The mature and immature forest types were further classified by species, age, height, stocking, and site. Species composition was by gross volume, using 20% limits for 20-year classes up to 140 years; the next two classes were 141–250 and 251+ years. Height was put into 9-metre (30-foot) classes. Stocking classes were relatively broad, grouping all immature stands into one class. Stands with 25–75% disturbance were classed mature residual, while stands without any major disturbance were divided into two groups on the basis of having more or less than 76 trees (27.5+ cm dbh) per hectare (this class further included some refinements for relationships of dominants and co-dominants, using four main classes). The not-satisfactorily-restocked description was applied to denuded areas that do not meet minimum stocking requirements of approximately 750 healthy, well-distributed seedlings or juvenile stems per hectare. Areas with 26–75% disturbance that still supported remnants of the original forest were classed as mature residual, whereas the non-commercial forest classification applied mainly to deciduous brush growing on productive sites. In addition to the above classification, some disturbances or activities (if any) were recorded for each stratum, such as those caused by fire, logging, insects, diseases, windfall, slide, ice, snow, and humans.

In 1973, the inventory program was expanded to include the identification of environmentally sensitive areas that should be protected from harvesting, as well as areas that need special consideration in terms of multiple resource use. Timber production constraints recognized by this program include soil and steepness problems, regeneration or plantation constraints, inoperability, avalanche and snow chute hazards, high recreational values, and essential habitat for wildlife and fish.

The sampling system used in the management unit inventories was a kind of stratified random sampling. Mature forest types were grouped into 42 inventory types, immature stands were grouped into 17 growth types, and two or four fixed-radius plots were collected in each type with the objective of providing an average volume for the particular management unit. Since sample compilations occurred at the end of the field season, adequate control could not be implemented on the optimization of the number of samples per sub-population. Consequently, some aggregated types contained as few as two samples, while the major types contained up to 100 random samples.

The initial design of the sampling system was efficient and delivered the required information for management decisions. However, as adjacent management units were completed, the sampling design was not adjusted to include applicable samples from other management units, especially those belonging to the same ecological region. As a result, in some populations up to 1,000 samples were collected, while other aggregated types were not sampled adequately. Another major weakness of the sampling system was that the classification parameters did not explain the high degree of variation in volume within the aggregated types. Therefore, the increased number of

samples had a beneficial effect only on the sampling error, but did not improve the capability of estimating the volume of individual stands. This was largely due to the effect of the broad class intervals on the parameters of the classification system, especially the stocking classes.

The sub-unit inventory system, started in 1977, introduced some major changes in classification, sampling, and data analysis. In particular, the class intervals were abolished and the classification parameters were measured in continuous units. Species composition (to the nearest 10%), age in years, and height in metres was recorded; the stocking classes were changed to stems per hectare or to crown closure to the nearest 10%. Also, the sample design was changed to a multi-phase sampling system in order to capitalize on large-scale photo samples at Phase 1, then still utilize all the available ground samples at Phase 2. This new approach allowed the use of regression estimators for volume calculations. Site index of each stand could be calculated from age and height, then volume was estimated through a regression equation with age, site index, and crown closure or stems per hectare as independent variables.

The 10-Year Re-inventory Program: 1988–1998

The objectives of the re-inventory program are to develop and maintain a quantitative description of the forest resources in the province, and to assess the land for its potential for growing trees continuously, producing livestock and wildlife, providing forest-oriented recreation, and accommodating other forest uses.

Components of the re-inventory program are described in detail in the Forest Inventory Manual and the highlights are summarized briefly as follows.

Classification Using 1:15,000 scale aerial photographs, the land is stratified into homogeneous strata with a minimum size of 5 hectares. Each stratum is then given a unique number within a 6' x 12' BCGS mapsheet, and the attribute list is filled out according to the specifications of the classification system.

Land is first divided into three broad classes: non-forest land, non-productive land, and productive forest land. Non-forest land is further subdivided as productive open range, cultivated and urban areas, wild meadows, non-productive barren lowland, alpine, swamp, and other non-productive forest and brush. Land is stratified as productive forest if it can provide the greatest contribution to the social and economic welfare of the province when it is maintained, under forest management, in successive crops of trees or forage, or both. Productive forest land is then described in terms of the following parameters.

1. **Species composition**: is identified to the nearest 10% of total volume when trees are equal to or greater than 7.5 cm dbh, or to the nearest 1%, if practical. When trees are less than 7.5 cm dbh species composition is recorded to the nearest 10% by number of stems.

2. **Age**: is estimated to the nearest year, based on the average total age of the leading species, using dominants defined as the 100 largest trees per hectare.
3. **Height**: is estimated to the nearest 0.1 metre when practical, otherwise to the nearest 1 metre, based on the leading species, using dominants defined as the 100 largest trees per hectare.
4. **Crown closure**: is estimated to the nearest 10% of the area occupied by the canopy, through vertical projections, of the trees equal to or greater than 7.5 cm dbh.
5. **Stand density**: is estimated or measured to the nearest stem per hectare of the trees equal to or greater than 7.5 cm dbh.
6. **History**: is described according to the specifications of the Silviculture Branch and includes disturbances, site preparation, stand tending, and regeneration.
7. **Environmental sensitivity**: is described to reflect the environmental, social, economic, and technological factors in force at the time of the inventory. In particular, the following factors are recognized:
   Soil sensitivity (Es): is given to strata on fragile or unstable soils, which are likely to be subject to severe deterioration if trees are removed by harvesting.
   Plantation or regeneration sensitivity (Ep): is designated when reforestation may be difficult and the delay could be 20 years or more, following disturbance such as harvesting or fire.
   Avalanche sensitivity: is recognized in cases where lack of disturbance prevents or constrains the occurrence of snow avalanche, hence protecting artificial features and natural resources.
   Recreation sensitivity (Er): is designed for strata with recreational values that are sensitive to environmental modification, particularly timber harvesting.
   Wildlife habitat sensitivity (Ew): is given to strata with wildlife habitat value that warrants management consideration and/or protection.
   Watershed sensitivity (Eh): is designated for strata where watersheds or drainage systems require special management considerations and/or protection, in order to maintain water quality and quantity.
   Fisheries sensitivity (Ef): is recognized for strata where stream systems must be managed or protected for fish populations.
8. **Inoperable problem areas**: are strata containing merchantable or potentially merchantable timber, but because of some physical barrier or other limitations, are considered inoperable in terms of current harvesting techniques.

Sampling The main objective of sampling is to obtain an estimate of the parameters specified under classification, or of the variables that may be derived from them. In the case of forest land, the main derived variable is volume, which needs to be estimated at an allowable sampling error of plus or minus 10% at a 95% confidence interval.

The sampling system selected for the re-inventory is a multi-phase stratified random sampling, using large-scale aerial photo plots and ground samples within the context of double sampling. Since most of the province has been sampled previously, the sampling system was designed to take advantage of the existing inventory data and ground samples. Area summaries by major strata, and scattergrams of existing ground samples, can provide valuable information for the planning and implementation of re-inventories. In particular, such data may be used to identify the strata that have not been sampled previously, such as second growth and deciduous stands. In addition, existing samples provide reliable estimates of sample variances and, hence, can be used to calculate the number of sample variances that may be required within each major stratum. Components of the sampling system are summarized as follows:

Phase 1 samples: are large-scale, 1:200 – 1:2,000 aerial photo plots distributed randomly or in a restricted random manner. Random distribution of photo samples may be achieved by selecting candidate strata, with the aid of random numbers, within the entire management unit, sub-unit, or map sheet. The number of candidate strata to be selected depends on the intensity of sampling and the existing variation within major strata. Experience indicated that in an average management unit of 150 map sheets (each map sheet being 12° longitude and 6° latitude at 1:20,000 scale, covering approximately 14,000 hectares), four to six strata should be selected randomly per map sheet to provide the required accuracy and precision; in an average sub-unit (consisting of about 20 map sheets at 1:20,000), on the other hand, up to 30 photo samples may be required per map sheet to estimate the volume of each major stratum at ± 10% sampling error at the 95% confidence level. In addition, strata containing previous samples are automatically chosen for Phase 1 sampling.

In each stratum selected at Phase 1, a strip is located randomly, along which continuous stereo photos are obtained, using twin Hasselblad 70 mm cameras mounted at a fixed distance apart on an aerial camera platform attached to a helicopter. In most cases, the photo interpreter is in the helicopter when the photos are taken and records air calls to aid in species identification and in the estimation of age and height. Six fixed-radius plots are then randomly selected along each strip to constitute the Phase 1 photo samples. Data obtained on the photo plots include species identification, stem count, height, crown diameter, crown length, estimation of quality, and assessment of crown closure. With the aid of these variables, volumes are estimated for each of the six plots and averaged for the sample. As the inventory proceeds, photo plots are subjected to statistical analyses in order to ensure that all major strata are sampled, but without oversampling. As soon as the required accuracy is obtained in a stratum, the remaining stereo photos are then used only for photo-interpretation or classification purposes.

Phase 2 samples: are ground samples selected in a restricted random manner from the photo samples with the purpose of covering the range of variation encountered in photo samples. The ratio of photo samples to ground

samples is governed by the strength of the relationship between the two samples and the corresponding costs. Experience indicates that this ratio is 4:1, although it may be as great as 10:1. However, if preliminary tests indicate that the relationship between Phase 1 and Phase 2 samples is weak, then Phase 1 samples may be discontinued or used only for classification purposes.

Measurements on ground samples include dbh, age, height, and pathological and quality indicators for each tree, as well as species identification and measurement of crown closure. While ground samples consist mainly of six points located along a line across the stratum, where the in-trees are selected with the aid of a relascope, fixed-radius plots are recommended for types wherein a large portion of the trees are below the minimum diameter. In the case of point samples, the band is selected with the objective of obtaining 30 to 70 trees per six-point sample. Similarly for fixed-radius plots, the objective is to obtain about 100 trees on six plots, hence plot size is selected accordingly.

Sample compilation and application: Volumes at Phase 1 and 2 are compiled at close utilization, then compared in terms of double sampling, using regression equations. For this comparison, all previously collected ground samples are used and the values of photo samples are "corrected" with the appropriate regression equation. Next, volume equations are developed with the pooled sample database, using age, site index, and crown closure or stems per hectare as independent variables. These regressions are developed for each species, based on pure stands, then applied to the mixed species samples by prorating the species composition. The purpose of this exercise is to evaluate the synergistic or antagonistic relationships that may exist between the various species growing in mixtures. Next, the single-species volume equations are applied to each polygon and prorated in terms of species compositions. For example, if species A contributes 70% to the stand, the pure species volume equation for species A is multiplied by 0.7 in order to adjust for the species composition.

Hence, the sample database is linked to the individual stands or polygons through a refined classification system, rather than through average volumes by aggregated types. For this reason, volumes can be calculated on stand-specific bases.

Digital Conversion Based on the data obtained from interpreted aerial photographs and samples, individual polygons are described in terms of the classification system. These descriptions are entered into an attribute file and referenced through the unique numbers. The classification system is applied consistently in a horizontal (strata) and vertical (layers) plane, hence a separate description is given for each layer of multi-story stands.

If the re-inventory is implemented in an area where the forest cover maps have been previously digitized, then the boundaries of polygons can be entered directly from photographs onto the digital file. Otherwise, all relevant layers of information must be converted into digital form. Procedures for digitization are documented in the Forest Inventory Manual.

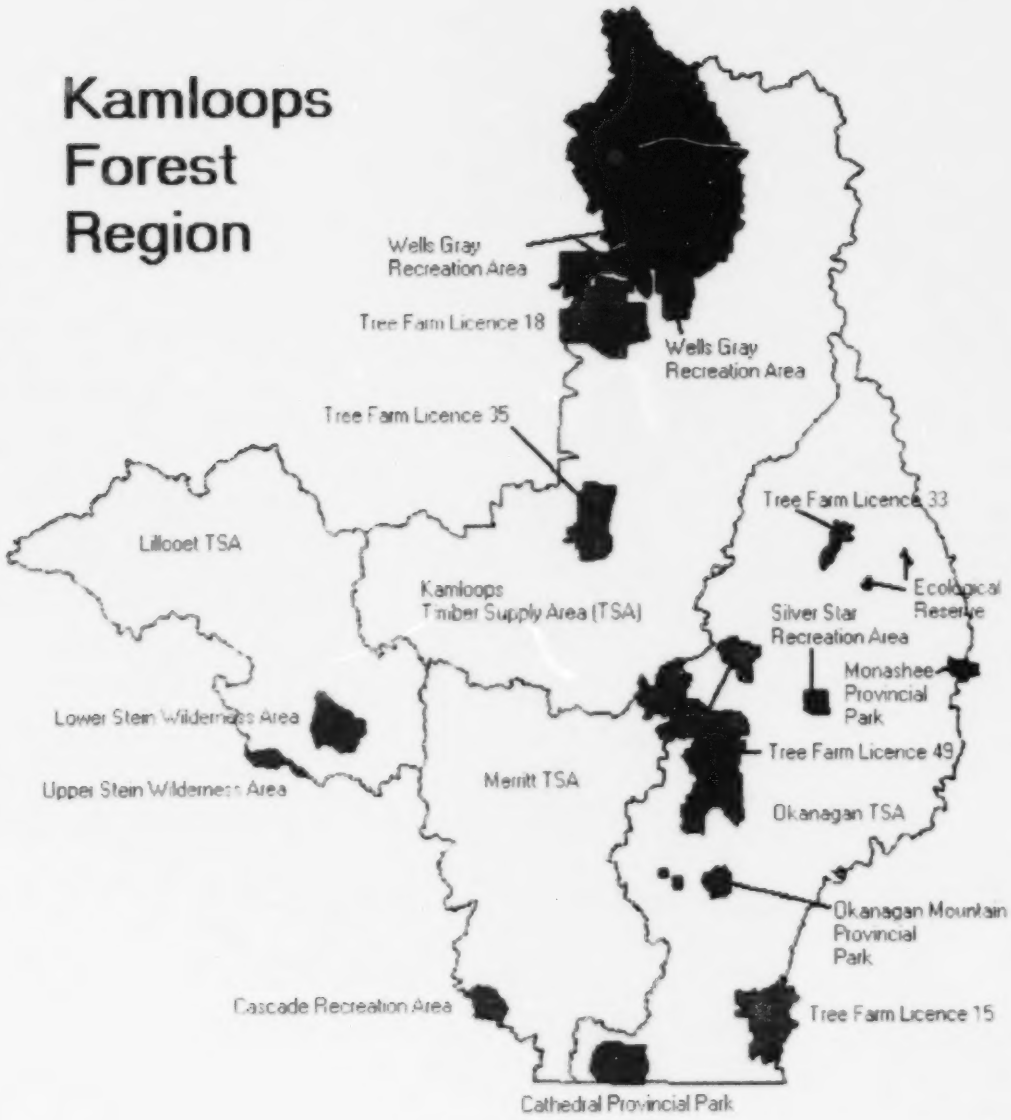
The geo-referenced forest land information consists of up to 19 levels of overlays, including forest cover, cadastre, information on other resources, and various levels of administrative boundaries. These levels are overlaid with the aid of a geographic information system and the areas of resultant polygons are linked to the volume files.

Inventory Update Program

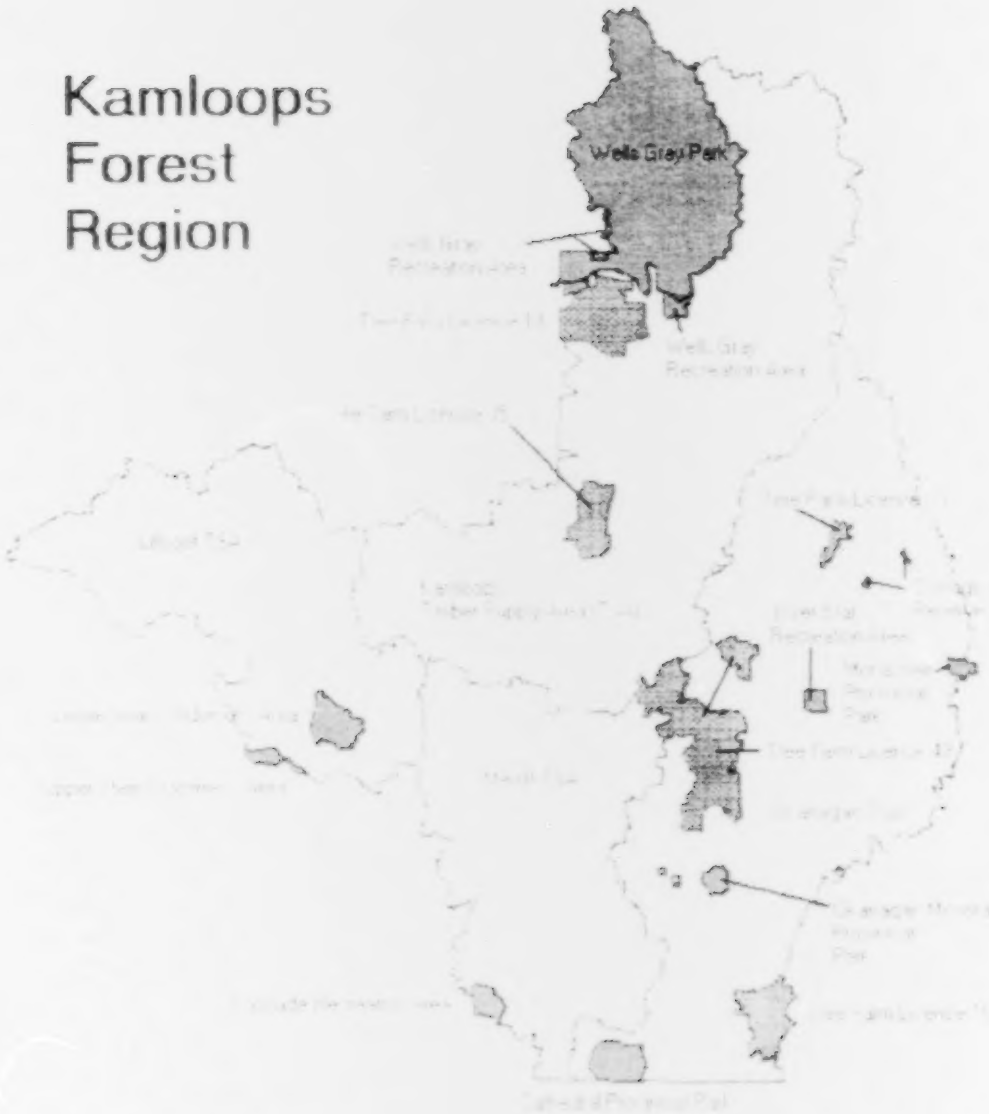
In addition to the 10-year inventory program, all maps are updated on a 2-year cycle, using satellite imagery. Hence, 3,300 maps need to updated annually. These updates include changes since the last inventory, such as harvesting, fire, and damage by insects and disease. During these updates, any available information on stand treatments and history are also entered into the database.

Areas reported, areas not reported, and total area (hectares): Kamloops Region

	Reported from Database	Other Data	Not Reported	Total Area
Timber Supply Areas				
Kamloops Timber Supply Area	2,085,081			2,085,081
Lillooet Timber Supply Area	1,123,858			1,123,858
Merritt Timber Supply Area	1,113,439			1,113,439
Okanagan Timber Supply Area	2,162,335			2,162,335
100 Mile House Timber Supply Area	24,866			24,866
Area Outside Designated Unit			634	634
Other Timber Supply Areas	55			55
Tree Farm Licences				
Tree Farm Licence 15, Inkaneep		49,041		49,041
Tree Farm Licence 18, Clearwater		74,489		74,489
Tree Farm Licence 33, Sicamous		8,297		8,297
Tree Farm Licence 35, Jamieson Creek		39,304		39,304
Tree Farm Licence 49, Okanagan (Formerly 9-16 and 32)		145,312		145,312
Protected Areas Reported On				
Apex Mountain Recreation Area	541			541
Cascade Recreation Area	12,758			12,758
Cathedral Provincial Park		33,099		33,099
Coquihalla Summit Recreation Area	1,741			1,741
Darke Lake Provincial Park	1,482			1,482
Ecological Reserve 034, Big White Mountain	761			761
Ecological Reserve 043, Mount Griffin	1,325			1,325
Ecological Reserve 049, Kingfisher Creek	1,462			1,462
Ecological Reserve 108, Cougar Canyon	548			548
Eneas Lakes Provincial Park	1,038			1,038
Kalamalka Lake Provincial Park	911			911
Monashee Provincial Park	7,468			7,468
Okanagan Mountain Provincial Park	10,438			10,438
Roderick Haig-Brown Park	481			481
Silver Star Provincial Park	8,743			8,743
Spahats Creek Provincial Park	311			311
Wells Gray Recreation Area	9,296			9,296
Protected Areas Not Reported On				
Ecological Reserve 051, Browne Lake	40			40
Wells Gray Provincial Park			536,681	536,681
Kamloops Region Totals	6,568,976	349,541	537,316	7,455,833


Kamloops
Forest
Region
Wells Gray
Recreation Area
Tree Farm Licence 18
Wells Gray
Recreation Area
Tree Farm Licence 35
Tree Farm Licence 33
Lillooet TSA
Kamloops
Timber Supply Area (TSA)
Ecological
Reserve
Silver Star
Recreation Area
Monashee
Provincial
Park
Lower Stein Wilderness Area
Upper Stein Wilderness Area
Merritt TSA
Tree Farm Licence 49
Okanagan TSA
Okanagan Mountain
Provincial
Park
Cascade Recreation Area
Tree Farm Licence 15
Cathedral Provincial Park

Kamloops Forest Region



Section A

Kamloops Timber Supply Area

In the Kamloops Forest Region (TSA 11)

	Page
Physical Land Base and Administration	1

Reports by Inventory Type Group and Height Class

Kamloops Timber Supply Area	3
Blue River Regional Park	49
Niskonlith Lake Provincial Park	54
North Thompson River Provincial Park	58
Roderick Haig-Brown Park	60

Kamloops Timber Supply Area

In the Kamloops Forest Region (TSA 11)
Physical Land Base and Administration
Area (ha)

Physical Land Base		Area Totals
Forest		1,568,655
Alpine	174,293	
Open range	148,590	
Lake	43,449	
Clearing	39,375	
Alpine forest	28,356	
Non-productive brush	25,118	
Swamp or muskeg	23,568	
Urban	23,141	
Non-productive	15,356	
River	10,811	
Rock	9,820	
Meadow	2,036	
Non-productive burn	1,986	
Gravel bar	128	
Clay bank	21	
Gravel Pit	9	546,056
Total for the Kamloops Timber Supply Area		2,114,711

Kamloops Timber Supply Area

In the Kamloops Forest Region (TSA 11)
Physical Land Base and Administration
Area (ha)

Administration of Land Base				Area Totals
Land under Private Administration				
Crown Granted				203,733
Land under Provincial Administration				
Area in a Timber Supply Area (62C)				
	In a Provincial Forest	1,701,013		
	Not in a Provincial Forest	119,834	1,820,847	
Miscellaneous reserves (69N)				
	In a Provincial Forest	8,441		
	Not in a Provincial Forest	14,861	23,302	
Woodlots				
	Private land	318		
	Aboriginal reserves	1,849		
	Provincial Crown land	2,670	4,836	
Miscellaneous Areas				
UREP Reserves: Use, Recreation, and Enjoyment of the Public			3,866	
Park equivalent or reserve including Recreation Areas, Regional				
Parks, Heritage Sites and Wildlife Management Reserves			249	
Christmas tree permits			1,055	
Miscellaneous leases (rod & gun etc) not defined			10	
Class A provincial park (park not named)			937	
Special purpose lease			3,131	
Active Timber Licence in a Timber Supply Area			17,137	
1092	Roderick Haig-Brown Park	205		
1070	Niskonlith Lake Provincial Park	134		
571	North Thompson River Provincial Park -Was Clearwater	130		
670	Blue River Regional Park	108	576	1,875,946
Land under Federal Administration				
Aboriginal reserves			32,077	
Federal Reserves			2,955	35,032
Total for the Kamloops Timber Supply Area				2,114,711

Section B

Lillooet Timber Supply Area

In the Kamloops Forest Region (TSA 15)

	Page
Physical Land Base and Administration	1

Reports by Inventory Type Group and Height Class

Lillooet Timber Supply Area	3
Marble Canyon Provincial Park	42
Skwaha Lake Ecological Reserve	47
Soap Lake Ecological Reserve	56
Upper & Lower Stein Wilderness Areas	61

Lillooet Timber Supply Area

In the Kamloops Forest Region (TSA 15)
Physical Land Base and Administration
Area (ha)

Physical Land Base		Area Totals
Productive Forest		573,559
Alpine		
Alpine forest	356,261	
Non-productive	65,390	
Open range	39,875	
Rock	25,700	
Lake	19,017	
Non-productive brush	17,002	
Clearing	6,144	
River	5,030	
Urban	4,720	
Non-productive burn	4,385	
Swamp or muskeg	3,916	
Meadow	1,499	
Clay bank	967	
Gravel bar	316	
Sand	68	
	11	550,299
Total for the Lillooet Timber Supply Area		1,123,858

Lillooet Timber Supply Area

In the Kamloops Forest Region (TSA 15)
Physical Land Base and Administration
Area (ha)

Administration of Land Base			Area Totals
Land under Private Administration			
Crown Granted			24,871
Land under Provincial Administration			
Area in a Timber Supply Area (62C)			
In a Provincial Forest	991,708		
Not in a Provincial Forest	26,215	1,017,923	
Miscellaneous reserves (69N)			
In a Provincial Forest	11,935		
Not in a Provincial Forest	3	11,938	
Woodlots			
Private land	217		
Provincial Crown land	1,660	1,877	
Miscellaneous Areas			
UREP Reserves: Use, Recreation, and Enjoyment of the Public		1,697	
Park equivalent or reserve including Recreation Areas, Regional Parks, Heritage Sites and Wildlife Management Reserve		132	
Active Timber Licence in a Timber Supply Area		104	
Miscellaneous leases (rod & gun etc) not defined		58	
Protected Areas			
class A provincial park (park not named)		46	
Ecological reserves		42	
Wilderness Areas within Provincial Forests		42,439	
544 Marble Canyon Prov. Park		327	
803 Ecol. Res. 003 Soap Lake		199	
888 Ecol. Res. 088 Skwaha Lake		846	1,077,627
Land under Federal Administration			
Aboriginal reserves			21,359
Total for the Lillooet Timber Supply Area			1,123,858

Section C

Merritt Timber Supply Area

In the Kamloops Forest Region (TSA 18)

	Page
Physical Land Base and Administration	1
Reports by Inventory Type Group and Height Class	
Merritt Timber Supply Area	3
Kentucky-Alleyne Provincial Park	37
Nickel Plate Prov. Park	42

Merritt Timber Supply Area

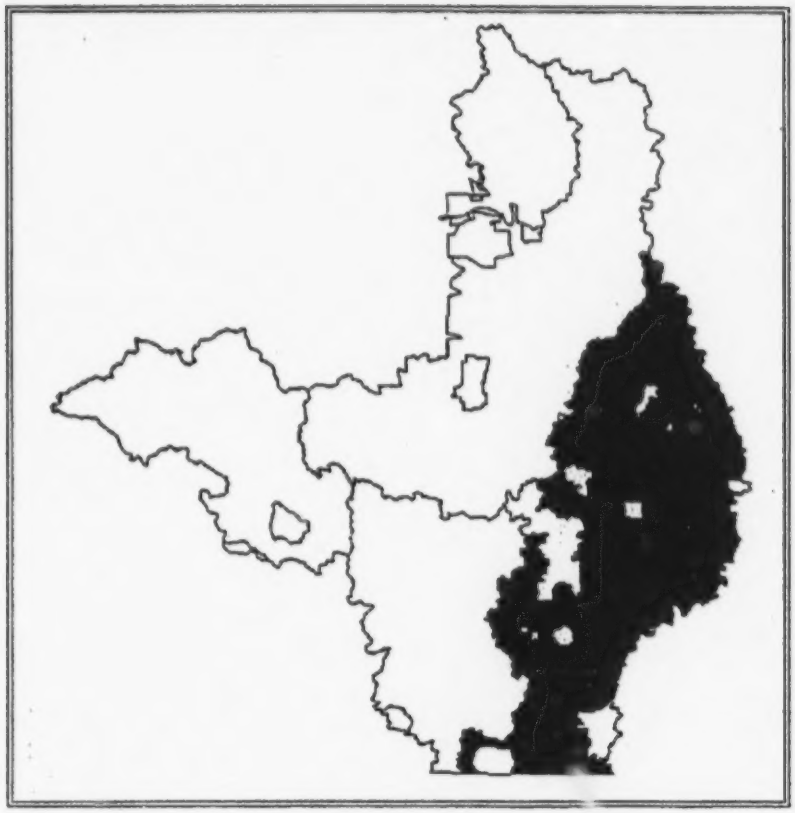
In the Kamloops Forest Region (TSA 18)
Physical Land Base and Administration
Area (ha)

Physical Land Base		Area Totals
Productive Forest		888,897
Open range	122,086	
Clearing	15,303	
Alpine	13,444	
Alpine forest	12,573	
Lake	10,673	
Non-productive	10,419	
Urban	10,094	
Swamp or muskeg	9,133	
Rock	7,354	
Non-productive burn	7,119	
Non-productive brush	3,896	
River	1,875	
Meadow	394	
Gravel bar	132	
Clay bank	49	224,543
Total for the Merritt Timber Supply Area		1,113,439

Merritt Timber Supply Area

In the Kamloops Forest Region (TSA 18)
Physical Land Base and Administration
Area (ha)

Administration of Land Base		Area Totals
Land under Private Administration		
Crown Granted		161,683
Land under Provincial Administration		
Area in a Timber Supply Area (62C)		
In a Provincial Forest	885,426	
Not in a Provincial Forest	19,837	905,263
Miscellaneous reserves (69N)		
In a Provincial Forest	3,252	
Not in a Provincial Forest	94	3,346
Woodlots		
Private land	38	
Aboriginal reserves	589	
Provincial Crown land	2,344	2,971
Miscellaneous Areas		
UREP Reserves: Use, Recreation, and Enjoyment of the Public		3,260
Park equivalent or reserve including Recreation Areas, Regional Parks, Heritage Sites and Wildlife Management Reserves		83
Christmas tree permits		974
Miscellaneous leases (rod & gun etc) not defined		408
class A provincial park (park not named)		465
Ecological reserves		31
Protected Areas		
803 Ecol. Res. 003 Soap Lake		734
763 Kentucky-Alleyne Prov. Park		156
585 Cancelled (Formerly Princeton Prov. Park)		148
764 Nickel Plate Prov. Park		116
765 Stemwinder Prov. Park		4
Land under Federal Administration		
Aboriginal reserves	33,701	
Federal Reserves	96	33,797
Total for the Merritt Timber Supply Area		1,113,440



Section D

Okanagan Timber Supply Area

In the Kamloops Forest Region (TSA 22)

	Page
Physical Land Base and Administration	1
Reports by Inventory Type Group and Height Class	
Okanagan Timber Supply Area	4
Bear Creek Provincial Park	54
Campbell-Brown Ecological Reserve	56
Echo Lake Provincial Park	58
Lily Pad Lake Ecological Reserve	61
Mabel Lake Provincial Park	64
Mara Meadows Ecological Reserve	70
Rock Ovens Regional Park	75
Shuswap Lake Marine Park	78
Shuswap Lake Provincial Park	87

Okanagan Timber Supply Area

In the Kamloops Forest Region (TSA 18)
Physical Land Base and Administration
Area (ha)

Physical Land Base		Area Totals
Productive Forest		1,597,399
Clearing	101,061	
Alpine	99,682	
Lake	95,379	
Open range	88,254	
Alpine forest	63,506	
Urban	32,593	
Non-productive	30,785	
Rock	15,896	
Swamp or muskeg	15,632	
Non-productive brush	9,095	
Non-productive burn	8,178	
River	4,104	
Gravel bar	295	
Meadow	285	
Clay bank	189	564,936
Total for the Okanagan Timber Supply Area		2,162,335

Okanagan Timber Supply Area

In the Kamloops Forest Region (TSA 18)
Physical Land Base and Administration
Area (ha)

Administration of Land Base			Area Totals
Land under Private Administration			
Crown Granted			293,292
Land under Provincial Administration			
Area in a Timber Supply Area (62C)			
In a Provincial Forest	1,577,154		
Not in a Provincial Forest	109,036	1,686,190	
Miscellaneous reserves (69N)			
In a Provincial Forest	67,205		
Not in a Provincial Forest	6,386	73,591	
Woodlots			
Private land	3,256		
Aboriginal reserves	864		
Provincial Crown land	8,944	13,065	
Miscellaneous Areas			
Active Timber Licence in a Timber Supply Area		20,589	
UREP Reserves: Use, Recreation, and Enjoyment of the Public		5,430	
Crown and private in a Tree Farm Licence where the ownership stat		754	
class A provincial park (park not named)		591	
Active Timber Licence in a Timber Supply Area		377	
Miscellaneous leases (rod & gun etc) not defined		276	
Christmas tree permits		148	
Ecological reserves		62	
Park equivalent or reserve including Recreation Areas, Regional Parks, Heritage Sites and Wildlife Management Reserve		44	
Protected Areas		2,764	1,803,882
Land under Federal Administration			
Federal Reserves		865	
Aboriginal reserves		64,297	65,162
Total for the Okanagan Timber Supply Area			2,162,335

Protected Areas		Area Totals
1101	Shuswap Lake Marine Park (Multi Site)	552
518	Echo Lake Provincial Park	219
842	Ecol. Res. 042 Mara Meadows	192
753	Mabel Lake Provincial Park	187
754	Bear Creek Provincial Park	143
1184	Rock Ovens Regional Park	132
877	Ecol. Res. 077 Campbell-Brown	118
577	Shuswap Lake Provincial Park	113

Okanagan Timber Supply Area

In the Kamloops Forest Region (TSA 18)
Physical Land Base and Administration
Area (ha)

900	Ecol. Res. 100 Hayne's Lease	99
805	Ecol. Res. 005 Lily Pad Lake	99
807	Ecol. Res. 007 Trout Creek	85
513	Cinnemousun Narrows Provincial Park	79
552	Okanagan Lake Provincial Park	79
861	Ecol. Res. 061 Upper Shuswap River And Valley	78
851	Ecol. Res. 051 Browne Lake	77
1038	Herald Provincial Park	68
1253	Kalamalka West Provincial Park	64
563	Yard Creek Provincial Park	60
830	Ecol. Res. 030 Vance Creek	48
1092	Roderick Haig-Brown Park	29
930	Ecol. Res. 130 Mahoney Lake	27
758	Pennask Lake Park	25
647	Gardom Lake Provincial Park	25
1115	Sunnybrae Provincial Park	24
1114	Sun-Oka Beach Provincial Park	21
806	Ecol. Res. 006 Buck Hills Road	18
1128	White Lake Provincial Park	18
1042	Inkaneep Provincial Park	16
752	Victor Lake Provincial Park	15
1116	T. Dagnus Locheed Provincial Park	10
583	Haynes Point Provincial Park	10
598	Mara Provincial Park	9
656	Sicamous Beach Provincial Park	9
662	Mara Point Provincial Park	9
559	Vaseux Lake Provincial Park	5
1003	Celista Provincial Park	4
547	Monte Lake Provincial Park	2
		2,764

Section E

Tree Farm Licenses

In the Kamloops Forest Region

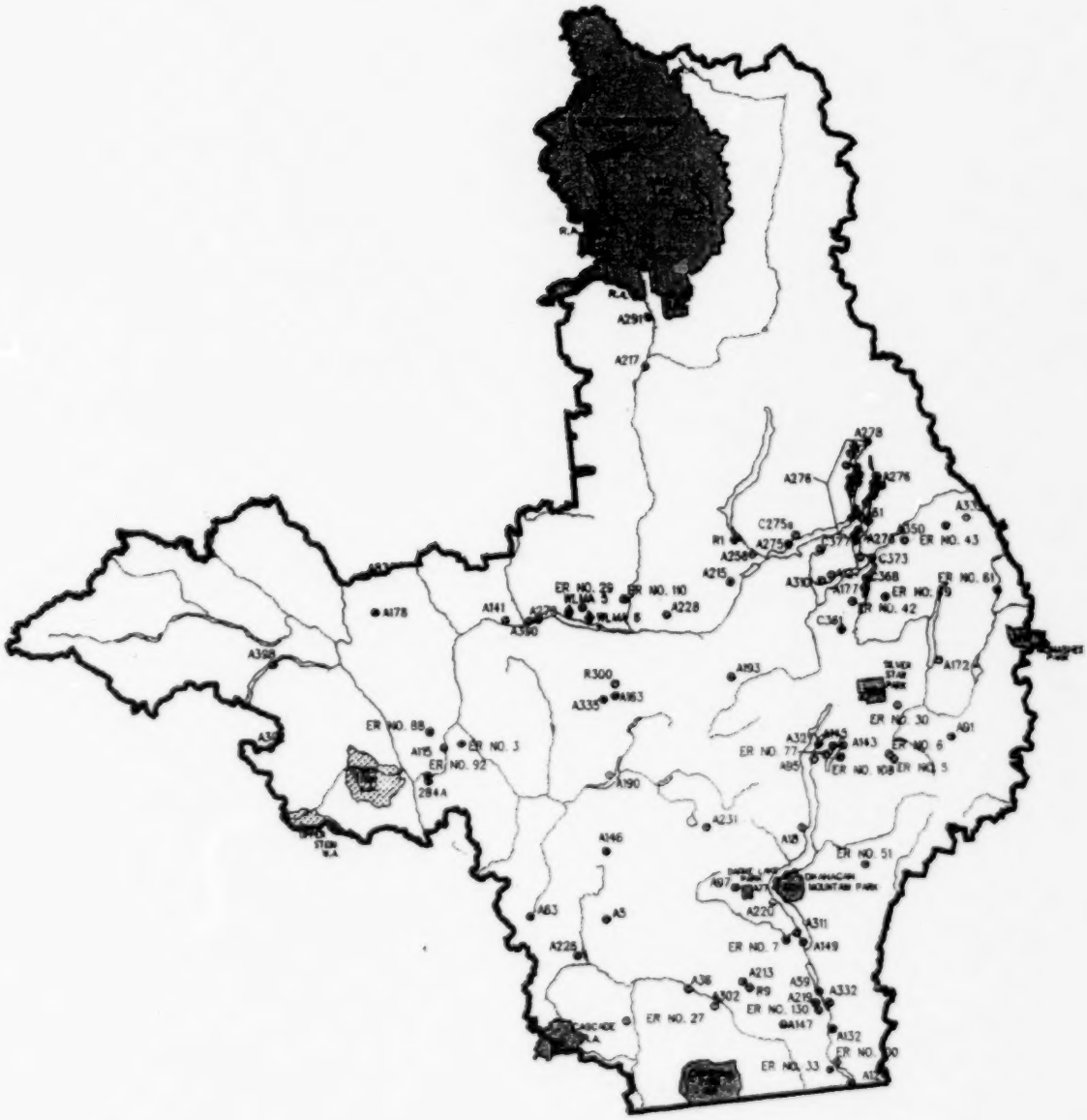
Reports by Inventory Type Group and Height Class	Page
Clearwater (TFL 18)	2
Inkaneep (TFL 15)	26
Jamieson Creek (TFL 35)	46
Okanagan (TFL 49)	65
Sicamous (TFL 33)	89

Section F

Protected Areas

In the Kamloops Forest Region

KAMLOOPS FOREST REGION



KAMLOOPS FOREST REGION

Protected Areas Outside of TSA's

In the Kamloops Forest Region

Reports by inventory type group and height class area	Page
Apex Mountain Recreation Area	2
Big White Mountain Ecological Reserve (Kamloops Forest Region)	8
Big White Mountain Ecological Reserve (Nelson Forest Region)	12
Browne Lake Ecological Reserve	16
Cascade Recreation Area (Kamloops Forest Region)	21
Cascade Recreation Area (Vancouver Forest Region)	33
Cathedral Provincial Park	44
Coquihalla Summit Recreation Area (Kamloops Forest Region)	49
Coquihalla Summit Recreation Area (Vancouver Forest Region)	55
Cougar Canyon Ecological Reserve	67
Darke Lake Provincial Park	72
Eneas Lakes Provincial Park	80
Kalamalka Lake Provincial Park	86
Kingfisher Creek Ecological Reserve	91
Monashee Provincial Park	97
Mount Griffin Ecological Reserve	109
Okanagan Mountain Provincial Park	116
Silver Star Recreation Area	128
Spahats Creek Provincial Park	147
Wells Gray Provincial Park	152
Wells Gray Recreation Area (Kamloops Forest Region)	174
Wells Gray Recreation Area (Cariboo Forest Region)	183

SECTION G **PROTECTED AREAS MAP INDEX**

PARK NAME	TYPE	PARK #
ADAMS LAKE	RA	1
AKAMINA-KISHINENA	RA	2
ALEXANDER BRIDGE	PP	3
ALICE LAKE	PP	4
ALLISON LAKE	PP	5
ANDREWS BAY	PP	6
ANDY BAILEY	RA	7
APEX MOUNTAIN	RA	9
APODACA	PP	10
ARBUTUS GROVE	PP	11
ARROW LAKES (SITES)	PP	12
ATLIN	PP	13
BABINE MOUNTAINS	RA	14
BALLINGALL ISLETS NATURE	PP	15
BAMBERTON	PP	16
BARKERVILLE	PP	17
BEAR CREEK	PP	18
BEATTON	PP	19
BEAUMONT	PP	20
BEAUMONT MARINE	PP	21
BEAVER CREEK	PP	22
BELLHOUSE	PP	23
BIG BAR LAKE	PP	24
BIJOUX FALLS	PP	25
BIRKENHEAD LAKE	PP	26
BLANKET CREEK	PP	27
BOTANICAL BEACH	PP	28
BOUNDARY CREEK	PP	29
BOWRON LAKE	PP	30
BOYA LAKE	PP	31
BOYLE POINT	PP	32
BRANDYWINE FALLS	PP	33
BRIDAL VEIL FALLS	PP	34
BRIDGE LAKE	PP	35
BROMLEY ROCK	PP	36
BROUGHTON ARCHIPELAGO MARINE	PP	36A
BROOKS PENINSULA	RA	37
BUCCANEER BAY MARINE	PP	38
BUCKINGHORSE RIVER WAYSIDE	PP	39
BUGABOO GLACIER	PP	40
BUGABOO ALPINE	RA	40A
BULL CANYON	PP	41
BURGESS AND JAMES GADSDEN	PP	42
CABBAGE ISLANDMARINE	PP	43
CANAL FLATS	PP	44
CANIM BEACH	PP	45
CAPE SCOTT	PP	46
CARIBOO NATURE	PP	47
CARMANAH PACIFIC	PP	48
CARP LAKE	PP	49
CASCADE	RA	50
CATHEDRAL	PP	51
CHAMPION LAKES	PP	52
CHARLIE LAKE	PP	53
CHASM	PP	54
CHEMAINUS RIVER	PP	55
CHILLIWACK LAKE	PP	56
CHILLIWACK RIVER	PP	57
CHINA BEACH	PP	58
CHRISTIE MEMEORIAL	PP	59
CHRISTINA LAKE	PP	60
CODVILLE LAGOON MARINE	PP	60A
CINNEMOUSUN NARROWS	PP	61
CODY CAVES	PP	62
COLDWATER RIVER	PP	63
COLUMBIA LAKE	PP	64
COLUMBIA VIEW	PP	65
CONKLE LAKE	PP	66
SOPELAND ISLANDS MARINE	PP	67
COQUIHALLA CANYON	RA	68
COQUIHALLA RIVER	RA	69
CORMORANT CHANNEL PARK	PP	69A
COQUIHALLA SUMMIT	RA	70
CROOKED RIVER	PP	71
CROWSNEST	PP	72
CULTUS LAKE	PP	73
CYPRESS	PP	74
DAHL LAKE	PP	75
D'ARCY ISLAND MARINE	PP	76
DARKE LAKE	PP	77
DAVIS LAKE	PP	78
DESOLATION SOUND MARINE	PP	79
DIANA LAKE	PP	80
DISCOVERY ISLAND MARINE	PP	81
DIONISIO POINT	PP	81A
DOWNING	PP	83
DREWRY POINT	PP	84
DRIFTWOOD CANYON	PP	85
DRUMBEG	PP	86
DRY GULCH	PP	87
DUNLEVY	RA	88
EAST PINE	PP	89
ECHO BAY MARINE	PP	90
ECHO LAKE	PP	91
ELK FALLS	PP	92
ELK LAKES	PP	93
ELK LAKES	RA	93
ELK VALLEY	PP	94
ELLISON	PP	95
EMORY CREEK	PP	96
ENEAS LAKES	PP	97
ENGLISHMAN RIVER FALLS	PP	98
ESKERS	PP	99
ETHEL F. WILSON MEMORIAL	PP	100
EXCHAMSIKS RIVER	PP	101
F.H.BARBER	RA	102
FILLONGLEY	PP	103
FIORDLAND	PP	104

PARK NAME	TYPE	PARK #
FOSSLI	RA	106
FRENCH BEACH	PP	107
FRY CREEK CANYON	PP	108
GABRIOLA SANDS	PP	109
GARDEN BAY MARINE	PP	110
GARIBALDI	PP	111
BLACK TUSK nca	PP	111
GIBSON MARINE	PP	112
GITNADOIX RIVER	RA	113
GOLDEN EARS	PP	114
GOLDPAN	PP	115
GOLDSTREAM	PP	116
GREEN INLET MARINE	PP	116A
GORDON BAY	PP	117
GREEN LAKE	PP	118
GROHMAN NARROWS	PP	119
GWILLIM LAKE	PP	120
HAKAI	RA	121
HALKETT BAY MARINE	PP	122
HARMONY ISLANDS MARINE	PP	122A
HAMBER	PP	123
HAYNES POINT	PP	124
HELLIWELL	PP	125
HEMER	PP	126
HERALD	PP	127
HORNE LAKE CAVES	PP	128
HORSEFLY LAKE	PP	129
INDIAN ARM MARINE	PP	131
INKANEEP0	PP	132
JACKSON NARROWS MARINE	PP	132A
ISLE-DE-LIS MARINE	PP	134
JAMES CHABOT	PP	135
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